Data and Tools to Support Performance-Based Planning and Programming

California Workshop

November 22, 2013

U.S Department of Transportation
Federal Highway Administration
Federal Transit Administration

Learning Objectives

- Describe several characteristics of an effective data collection approach for performance measurement
- Discuss multimodal data sources available for performance measure development
- Relate data collection and management efforts to key planning efforts

Data Do's and Don'ts

- Do relate data to goals, objectives, and targets
- Do collect data that is available and useful
- Do strategize about long-term data needs
- Do get your partners to share the load

- Don't collect data for the sake of collecting data
- Don't compromise on accuracy

  – Other Challenges??

Data Collection & Management

- **Central to every performance measurement program**
- **Structure and approach varies widely among organizations**
- **Three common components**
  - Collection
  - Analysis
  - Quality Assurance

Common Themes of Successful DOT Programs

- Decentralize responsibility for data collection and analysis to where data expertise resides
- Assign responsibility for each performance measure to a specific unit or group
- Centralize review and analysis of results from different levels within the organization
- Sophisticated data management systems are not necessarily required for program success

Data Sources for Performance Measurement

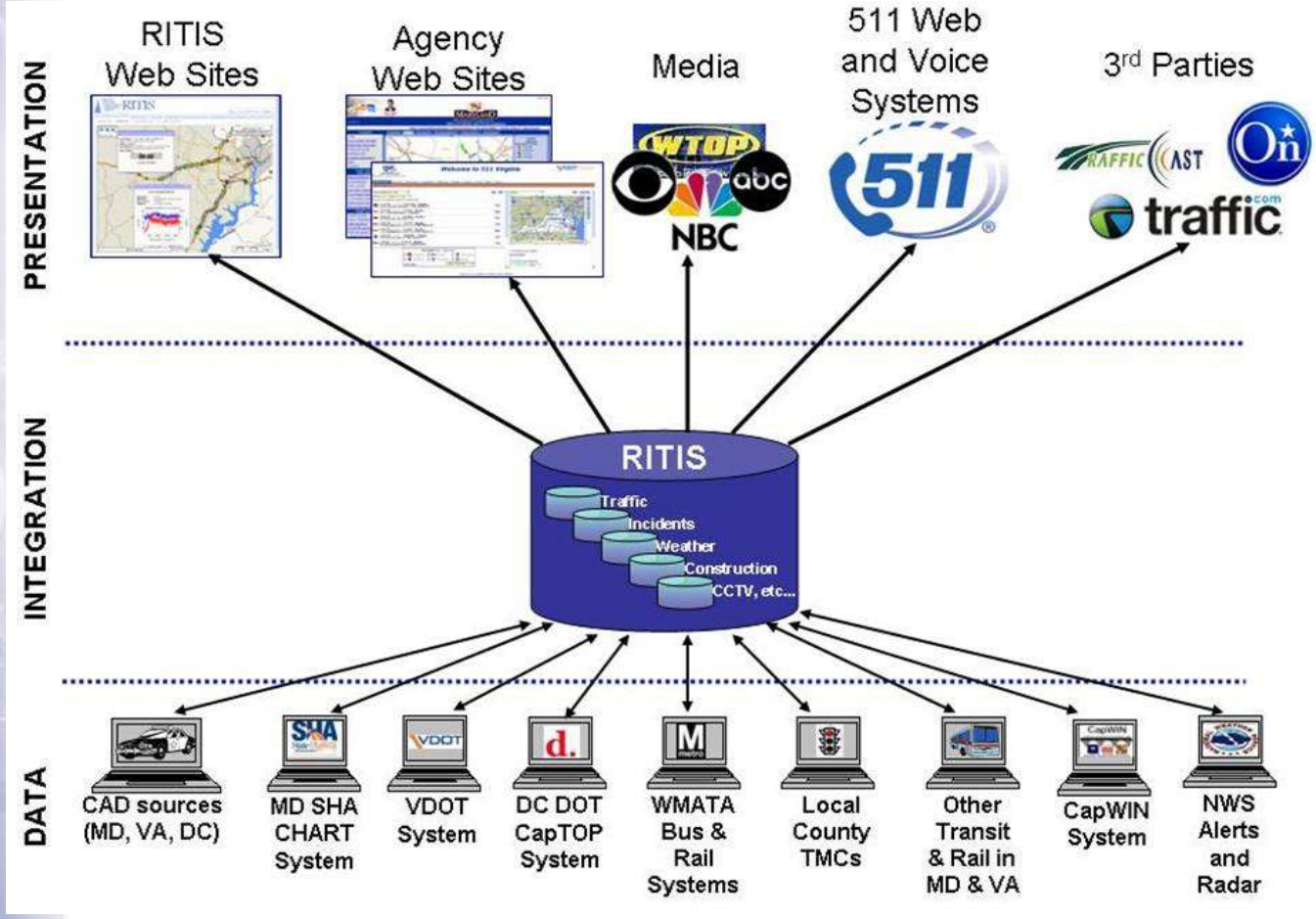
Performance Area	National/ Federal Data	State and Regional Data Sources
Safety	Fatality Analysis Reporting System (FARS)	State Crash Records Trauma data, others
Infrastructure Condition	Highway Performance Monitoring System (HPMS), National Bridge Inventory (NBI)	State collected detailed distress data, structural condition (FWD/RWD), others
Congestion	HPMS	Model output
Reliability	National Performance Management Research Data Set (NPRMDS) – Travel time Data	State purchased data, probe data (floating car, bluetooth)

Collaboration in Data Collection

- Data sharing is crucial to obtaining a system-wide, multi-modal view of operational performance
- Requires mutual standards for consistency and quality
- Allows regions to collect once, use often
- MPO/University Partnerships

Data Management Example
Utah DOT UPLAN

Regional Integrated Transportation Information System (RITIS)

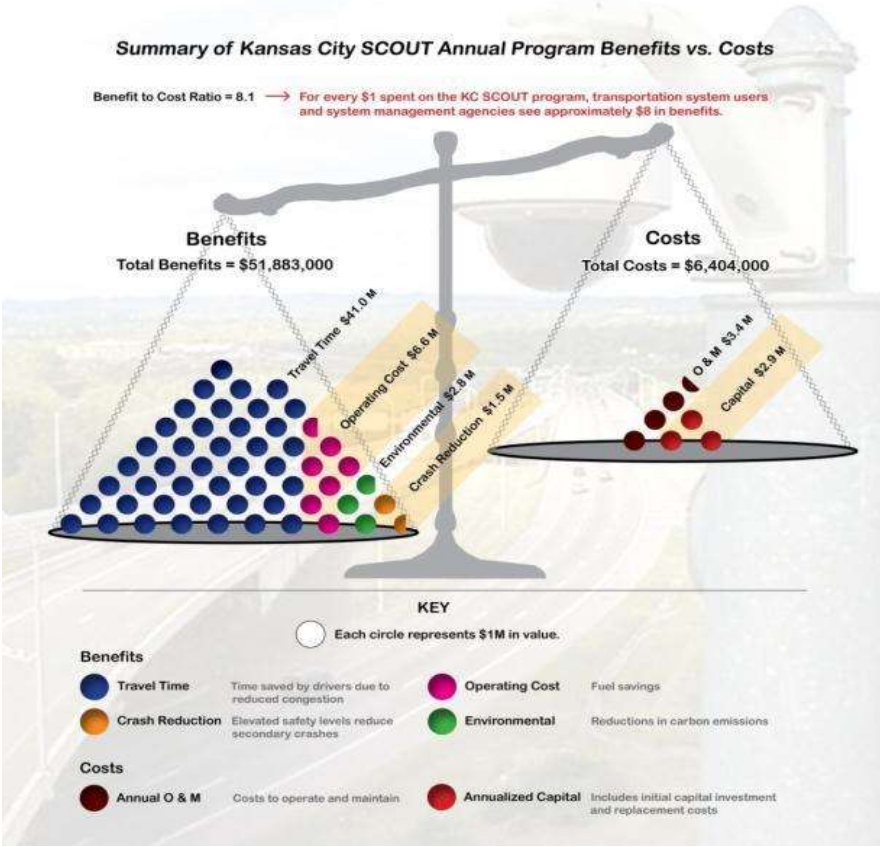


Data and Tools Support Key Planning Processes

- **Transportation Asset Management Plan (TAMP)**
  - Infrastructure condition data, asset lifecycle information
  - Pavement and Bridge management systems help evaluate investments and prioritize investments
- **Strategic Highway Safety Plan (SHSP)**
  - Fatality and serious injury data
  - CMFs, HSM, and other tools help identify effective approaches to improve safety
- **Congestion Management Process (CMP)**
  - Traffic counts, travel time data
  - Travel models, simulation tools help evaluate system and project performance

Analysis Tools

- **Help communicate to agency management, decision makers and the public**
  - Provides data on needs
  - Provides information on expected and/or realized benefits



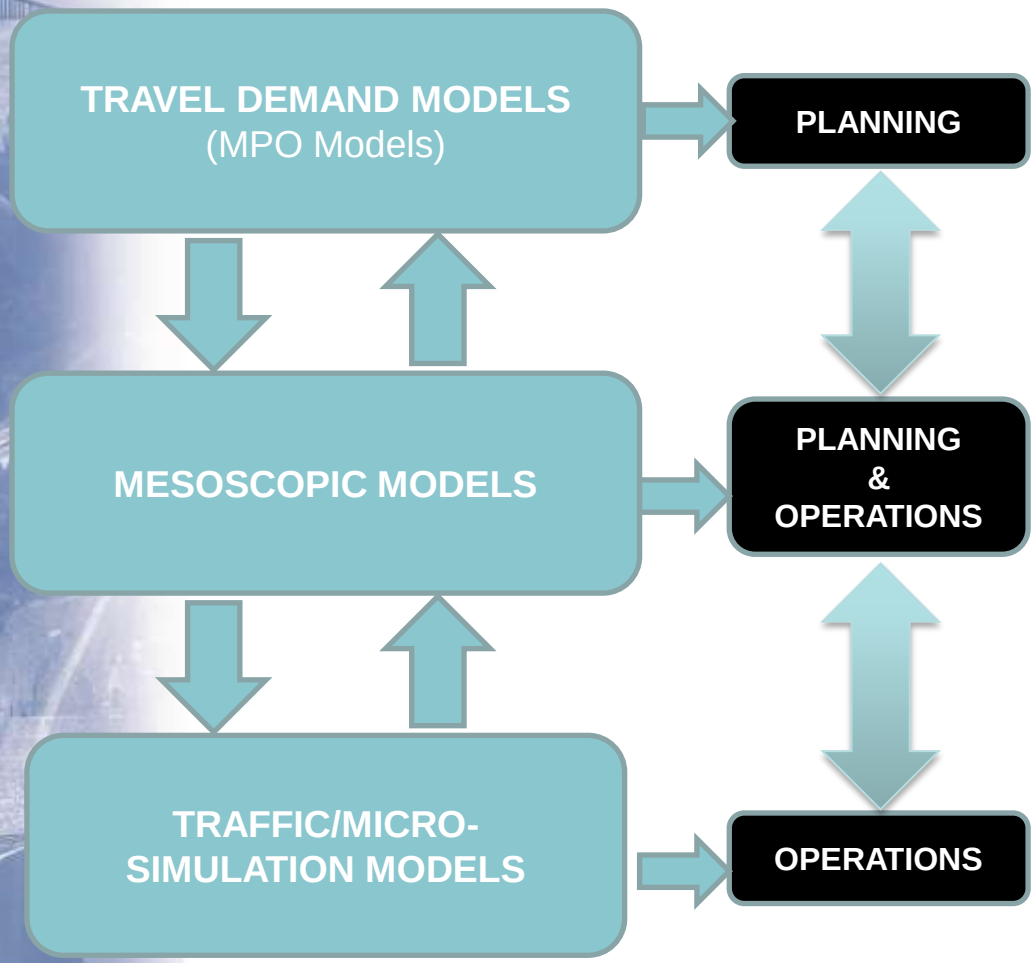
Safety Tools

- **Highway Safety Manual**
  - SafetyAnalyst
  - Interactive Highway Safety Design Model (IHSDM)
  - Crash Modification Factor (CMF) Clearinghouse
- **Proven Safety Countermeasures**
- **Systemic Approach**
- **PEDSAFE/BIKESAFE**

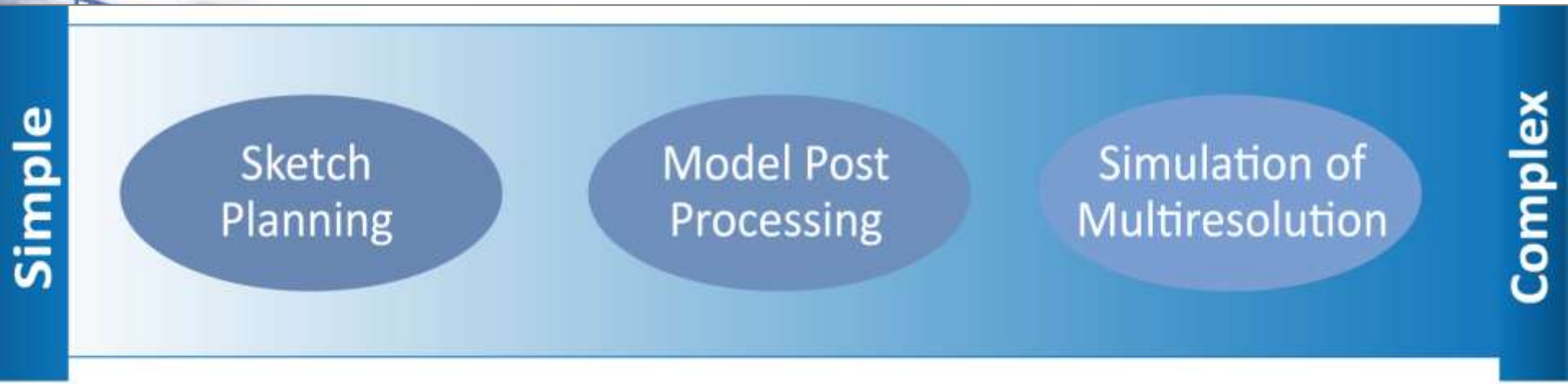
Infrastructure Tools

- **State management systems – pavement, bridge, maintenance, sometimes others**
- **FHWA tools**
  - Highway Economic Requirements System (HERS) and state version (HERS-ST)
  - National Bridge Inspection Analysis System (NBIAS)
  - Transit Economic Requirements Model (TERM) and local version (TERM-lite)
  - Life-Cycle Cost Analysis Software (RealCost)

Congestion Tools



Reliability Tools



Limited	Data Input	Comprehensive
Rough	Output	Precise
Shorter	Schedule	Longer
Limited	Expertise	Required

Freight and Economic Tools

- **Freight specific travel demand models (not common)**
- **Quick Response Freight Manual**
- **Economic Analysis Tools**
  - BCA.NET
  - Surface Transportation Efficiency Analysis Model (STEAM)
  - Highway Economic Requirements System (HERS-ST)
  - National Bridge Inventory Analysis System (NBIAS)

Environmental Tools

- **Air Quality Emissions and Greenhouse Gases**
  - Travel demand models
  - Motor Vehicle Emissions Simulator (MOVES)
    - EMFAC used in California
- **Natural resources**
  - Remote sensing
- **Water quality**
  - No specific tools

Group Discussion

- **Are there opportunities to leverage data and tools through cross-agency collaboration in your state or region?**

- **Provide an example of how your agency has overcome data challenges in the past**

Questions?